for a minimum of 10 minutes (see § 56.97–30(g)), examination for leakage must be made of all joints, connections and of all regions of high stress, such as regions around openings and thickness-transition sections.

(e) *Minimum required hydrostatic test pressure.* Except as otherwise permitted in § 56.97–30(f) or § 56.97–40, piping systems must be subjected to a hydrostatic test pressure that at every point in the system is not less than 1.5 times the maximum allowable working pressure.

(f) *Maximum permissible hydrostatic test pressure.* (1) When a system is tested hydrostatically, the test pressure must not exceed the maximum test pressure of any component such as vessels, pumps, or valves in the system.

(2) At no time during the hydrostatic test may any part of the piping system be subjected to a stress greater than 90 percent of its yield strength (0.2 percent offset) at test temperature.

(g) *Hydrostatic test pressure holding time.* The hydrostatic test pressure must be maintained for a minimum total time of 10 minutes and for such additional time as may be necessary to conduct the examination for leakage required by § 56.97–30(d).

[CGD 73–254, 40 FR 40167, Sept. 2, 1975, as amended by USCG–2003–16630, 73 FR 65185, Oct. 31, 2008]

§ 56.97–35 Pneumatic tests (replaces 137.5).

(a) *General Requirements.* When a pneumatic test is performed, it must be conducted in accordance with the requirements of this section.

(b) *Test medium and test temperature.* (1) The gas used as the test medium must not be flammable.

(2) The temperature of the test medium will be that of the available source unless otherwise approved by the Commandant upon review of the metallurgical aspects of the piping materials with respect to its brittle fracture properties.

(c) *Check of test equipment before applying pressure.* The test equipment must be examined before pressure is applied to ensure that it is tight and that all items that should not be subjected to the test pressure have been disconnected or isolated by valves or other suitable means.

(d) *Procedure for applying pressure.* The pressure in the system must gradually be increased to not more than one-half of the test pressure, after which the pressure is increased in steps of approximately one-tenth of the test pressure until the required test pressure has been reached.

(e) *Examination for leakage after application of pressure.* Following the application of pressure for the time specified in § 56.97–35(h), examination for leakage in accordance with 56.97–30(d) must be conducted.

(f) *Minimum required pneumatic test pressure.* Except as provided in § 56.97–35(g) or § 56.97–40, the pneumatic test pressure may not be less than 1.20 nor more than 1.25 times the maximum allowable working pressure of the piping subassembly system.

(g) *Maximum permissible pneumatic test pressure.* When a system is tested pneumatically, the test pressure may not exceed the maximum test pressure of any component such as vessels, pumps or valves in the system.

(h) *Pneumatic test pressure holding time.* The pneumatic test pressure must be maintained for a minimum total time of 10 minutes and for such additional time as may be necessary to conduct the examination for leakage required in § 56.97–30(d).

[CGD 73–254, 40 FR 40168, Sept. 2, 1975]

§ 56.97–38 Initial service leak test (reproduces 137.7).

(a) An initial service leak test and inspection is acceptable when other types of test are not practical or when leak tightness is conveniently demonstrable due to the nature of the service. One example is turbine extraction piping where shut-off valves are not available for isolating a line and where temporary closures are impractical. Others may be systems for service water, low pressure condensate, plant and instrument air, etc., where checking out of pumps and compressors afford ample opportunity for leak tightness inspection prior to fullscale operation.

(b) The piping system must be gradually brought up to design pressure. After inspection of the piping system has proven that the installation is